

REMARKS

In response to the above-reference Office Action, Applicant has amended claims 1, 6, 7, 9, 18, and 19. Accordingly, claims 1-20 are pending.

Claims Rejected Under 35 U.S.C. § 102

Claims 14, 17, and 18 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,784,699 issued to McMahon et al., ("*McMahon*").

With respect to the independent claim 14, among other limitations, the claim recites "n is a power of 2 and i is a positive integer, if the size of a requested memory space for allocation is greater than $\frac{n}{2^i}$ bytes, allocating an $\frac{n}{2^{i-1}}$ -byte memory space" and "if there is no valid entry in the $\frac{n}{2^i}$ -byte entry list, dividing the $\frac{n}{2^{i-1}}$ -byte entry list and allocating the divided $\frac{n}{2^{i-1}}$ -byte entry list as an $\frac{n}{2^i}$ -byte memory space."

McMahon does not disclose these limitations. To anticipate a claim, the Examiner must show that a single reference teaches each of the elements of that claim. Rather, *McMahon* discloses a dynamic memory allocator that searches for an available memory block from a free list that corresponds to the next largest bin size (col. 5, lines 35-39). The dynamic memory allocator identifies the smallest available memory block that accommodates the block size request (col. 3, lines 12-17). If the smallest available block is larger than the requested size, the available block is divided so that the first portion satisfies the request (col. 3, lines 54-58).

Claim 14 is not anticipated by *McMahon* because *McMahon* does not teach or suggest "dividing the $\frac{n}{2^{i-1}}$ -byte entry list and allocating the divided $\frac{n}{2^{i-1}}$ -byte entry list as an $\frac{n}{2^i}$ -byte

memory space.” Dividing an $\frac{n}{2^{i-1}}$ -byte entry as an $\frac{n}{2^i}$ -byte memory space is dividing $\frac{n}{2^{i-1}}$ into two equal size memory blocks where the size of each memory block is equal to $\frac{n}{2^i}$. The mathematical relationship between $\frac{n}{2^{i-1}}$ and $\frac{n}{2^i}$ is explained as follows. The larger block is divided into two equal size because $\frac{n}{2^{i-1}}$ is two times $\frac{n}{2^i}$. This relationship can be shown in the following substitutions. Since $\frac{1}{2^{i-1}} = \frac{1}{2^i \cdot 2^{-1}} = \frac{2}{2^i}$, $\frac{n}{2^{i-1}} = 2 \cdot \frac{n}{2^i}$. Therefore, it is shown that $\frac{n}{2^{i-1}}$ is two times $\frac{n}{2^i}$. *McMahon* does not disclose this mathematical relationship. Rather, the *McMahon* division merely divides the larger block in to two portions where the first portion is used to satisfy the request (col. 3, lines 57 and 58).

Furthermore, *McMahon* does not teach or suggest that if the requested byte size is greater than “ $\frac{n}{2^i}$ bytes” as recited in claim 14, a specific allocation is made and a different allocation is made if the byte size requested is equal to or less than “ $\frac{n}{2^i}$ bytes.” Rather, *McMahon* searches the next available memory block that accommodates the block size requested without identifying the different allocations. Specifically, *McMahon* does not teach or suggest that if the request byte size is larger than $\frac{n}{2^i}$ bytes, a memory block of $\frac{n}{2^{i-1}}$ -byte is allocated. Applicants note that the next available memory block is different from allocating a memory block in a specific size. Accordingly, since *McMahon* fails to at least teach or suggest this limitation, claim 14 is not anticipated by *McMahon*. Reconsideration and withdrawal of the rejection of claim 14 is respectfully requested.

With respect to claim 17, among other limitations, claim 17 recites “if the size of a deallocated memory space is greater than $\frac{n}{2^i}$ bytes, deallocating an $\frac{n}{2^{i-1}}$ -byte memory space to a data memory and including an entry corresponding to the memory space in an $\frac{n}{2^{i-1}}$ -byte entry list managed by a free list memory.” *McMahon* does not teach or suggest this limitation. Rather, *McMahon* discloses that small memory blocks originated from a large block of memory may be combined to the original large block of memory (col. 10, lines 6-9).

Claim 17 is not anticipated by *McMahon* because *McMahon* does not teach or suggest a condition that such combination of memory blocks takes place if the size of a de-allocated memory space is greater than a predetermined size, or “ $\frac{n}{2^i}$ bytes” as recited in claim 17. Since such condition is not present in *McMahon*, *McMahon* does not teach or suggest the limitations of claim 17. Accordingly, reconsideration and withdrawal of the rejection of claim 17 is respectfully requested.

Dependent claim 18 depends from claim 17 and therefore incorporates all the limitations of that claim. For at least the reasons discussed above, claim 18 is not anticipated by *McMahon*. Therefore, reconsideration and withdrawal of the rejection of claim 18 is respectfully requested.

Claims Rejected Under 35 U.S.C. § 103(a)

Claims 1, 3, 5-8, 10-13 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *McMahon* in view of U.S. Patent No. 6,892,285 issued to Ling et al. (“*Ling*”).

With respect to claim 1, among other limitations, claim 1 recites “a free list memory which manages a free memory space of the data memory as at least one entry; and registers that store head location information and tail location information of the at least one entry.”

The Examiner admits that *McMahon* does not teach or suggest “registers that store head location information and tail location information of the at least one entry” and relies on *Ling* for the teaching. Applicants respectfully submit that *Ling* also fails to teach or suggest this limitation and therefore does not cure *McMahon*. *Ling* discloses a FIFO buffer 260 that is associated with a head pointer 250 and a tail pointer 255 wherein the head pointer 250 points to the beginning of the data and the tail pointer 255 points to the end of the data (col. 5, 44-47). According to the Examiner, the head pointer 250 and the tail pointer 255 teaches or suggest the “head location information and tail location information of the list.” Applicants respectfully disagree with this assertion.

The head pointer 250 in *Ling* does nothing more than a connector that connects the multiple partitions (e.g. partition 290, 290+n, and 290+m) and the tail pointer 255 does nothing more than to indicate an end of a block of data. However, the “head location information and tail location information of at least one entry” recited in claim 1 is directed to the free list memory that manages a data memory. The *Ling* pointers point to the actual data in the partitions. Furthermore, Applicants have explicitly explained that a pointer for the start location and a pointer for the last location of each free list memory wherein when a request for memory is allocated, the first pointer 1301 is updated with a NEXT_FREE_LIST_PTR. (Applicants’ specification as filed on page 6, lines 27-32; page 7, lines 11-15). Therefore, the *Ling* head pointer 250 and the tail pointer 255 do not teach or suggest the “head location information and tail location information of at least one entry” as recited in claim 1.

Since *Ling* fails to teach or suggest this limitation, the combination of *McMahon* and *Ling* does not cure the deficiency of *McMahon*. Therefore, this combination does not teach or suggest each of the limitations in claim 1. Accordingly, reconsideration and withdrawal of the rejection of claim 1 is respectfully requested.

With respect to claim 5, claim 5 depends from claim 1 and for at least the reasons discussed above, *McMahon* does not teach or suggest the limitations of claim 5. Furthermore, claim 5 recites “a plurality of data blocks each having memory space of n bytes when n is a power of 2 and i and j are positive integers ($i < j$), and each data block comprises a plurality of sub data blocks each having a memory space of $\frac{n}{2^i}$ bytes and each sub data block comprises a plurality of sub data blocks each having a memory space of $\frac{n}{2^j}$ bytes.”

Applicants respectfully submit that although *McMahon* in col. 2, lines 66- Col. 3. line 1 discloses a dynamic memory allocator that assigns portions of memory into a large number of slots such that each slot includes memory blocks of equal size, this cited reference does not disclose a data block having memory space of n bytes when n is a power of 2.

In addition, the Examiner asserts that entries 1 and 2 in Table 1 of *McMahon* showing memory block sizes of 16 bytes and 32 bytes, respectively, disclose “sub data block each having a memory space of $\frac{n}{2^i}$ bytes and each sub data block comprises a plurality of sub data blocks each having a memory space of $\frac{n}{2^j}$ bytes.” Applicants respectfully disagree with this assertion.

The Examiner has explicitly interpreted the free list and the memory block in Table 1 of *McMahon* to have taught or suggested the “free list memory” and the “data block” respectively as recited in claim 5. As matter of law, the Examiner is required to interpret the claim limitations consistently. Here, the byte sizes in claim 5 relate to the sub data blocks which are contained in a data block. The fact that one memory block in Table 1 of *McMahon* discloses 16 bytes and another memory block in Table 1 of *McMahon* discloses 32 byte does not teach or suggest the sub data block sizes because the Examiner has interpreted the byte sizes disclosed in Table 1 to be the sizes for data

blocks, rather than the sizes for sub data blocks. Accordingly, because *McMahon* does not teach or suggest the limitations of claim 5, reconsideration and withdrawal of rejection of claim 5 is respectfully requested.

Dependent claims 3, 6-8, 10-13 depend from claim 1 and therefore incorporate the limitations of that claim. For the reasons discussed with respect to claim 1, these claims are patentable over the combination of *McMahon* and *Ling*

Dependent claim 15 depends from claim 14 and therefore incorporates the limitations of that claim. The Examiner solely relies on *McMahon* for teaching and suggesting the limitation. Since claim 15 depends from claim 14, for at the least the reasons discussed with respect to claim 14, *McMahon* does not disclose the limitation of claim 15. Furthermore, among other limitations, claim 15 recites “updating the head location value of the $\frac{n}{2^{i-1}}$ -byte entry list with the location value of a next entry in the same entry list.” The Examiner fails to establish that *McMahon* teaches or suggests this limitation. Accordingly, reconsideration and withdrawal of the rejection to claim 15 is respectfully requested.

Allowable Subject Matter

Applicants note with appreciation the Examiner’s indication of the allowable subject matter of claims 2, 4, 9, 16, 18, 19 and 20.

CONCLUSION

In view of the forgoing, it is believed that all claims now pending are in condition for allowance and such action is earnestly solicited at the earliest possible date. If there are any additional fees due in connection with the filing of this response, please charge those fees to our Deposit Account No. 02-2666. Questions regarding this matter should be directed to the undersigned at (310) 207-3800.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.


Linda D'Elia

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